REMARKS

The Official Action of July 27, 2006 and the references cited therein have been carefully reviewed. Reconsideration is respectfully requested in light of the foregoing claim amendments and the following remarks.

Amendments to the Claims:

Claim 1 has been amended to more precisely recite the steps involved in the process of the present invention. Support for this amendment can be found in the specification at page 11, lines 3-24; page 12, line 14 – page 13, line 13; page 14, lines 4-11 and in Example 1.

The amendments to claim 2 are for the sole purpose of providing clarity and conforming the language used in the claims.

Claim 3 has been amended to depend from claim 1. The amendments are for the sole purpose of providing clarity and consistency to the language used in the claims.

Claim 4 has been amended to depend from claim 1. Additionally, claim 4 has been amended to recite that a cold gas is discharged into the inner cavity of the parison during the inflation step. Support for this amendment can be found in the specification at page 11, lines 3-24 and in Example 1.

Claim 9 has been amended to depend from claim 1. The amendments are for the sole purpose of providing clarity and consistency to the language used in the claims.

Claims 10 and 11 have been amended for the sole purpose of providing clarity and consistency to the language used in the claims.

Claim 12 has been amended to depend from claim 1. Additionally, taking the Examiner's suggestion, the recitation "flat or at tapered at least" has been changed to "flat or tapered..." Further amendments to claim 12 are for the sole purpose of providing clarity and consistency to the language used in the claims.

Claim 29 has been amended to depend from claim 1 and further recite that the inner surface of the mold comprises surface imperfections. Support for this amendment can be found at page 6, line 29 – page 7, line 5 of the specification.

New claim 31 is added to recite that the second cooling means further comprises a means for allowing escape of gas out of the blow mold structure, while new claim 32 is added to recite the use of a blow-pin as the second cooling means.

New claims 33-35 are added to recite some of the specific features in the blow-pin. Support for these new claims can be found at page 16, lines 3-16 of the specification.

Claims 13-28 and 30 are canceled.

Correction of Previous Amendments:

It is noted that some errors have been made in the previous amendments to the claims, which were submitted on August 23, 2005. Please disregard these previously submitted amendments and replace all prior versions and listings of amendments with the new listing of claims presented in the amendments presented in this response.

Amended Claim 12 is Now Free of Grammatical Error:

At page 2 of the Official Action, the Examiner has objected to claim 12 for the inappropriate recitation of "flat or at tapered at least". This objection is now moot as the word "at" has been deleted from the claim.

The Meets and Bounds of the Amended Claims 1-12 and 26 are Clear and Definite:

At pages 2-4, claims 1-12, 26, and 29 have been objected to under 35 U.S.C. §112, 2nd paragraph, as failing to particularly point out and distinctly claim the subject matter. In light of the foregoing amendments, it is respectfully requested that these objections be withdrawn. Specifically, regarding claim 1, the claim has been re-written in a way that clearly recites all five (5) different and sequential process steps. Additionally, the prior recitation of "head has been modified" has been deleted.

With respect to claims 12 and 29, the recitation "the mold surface is roughened and not polished" has been deleted or changed to "the inner surface of the mold comprises surface imperfections". Additionally, claim 29 has been amended to depend from claim 1.

Finally, claim 26 has been canceled.

Rejections Under 35 U.S.C. § 102(b) and 103(a)

Claims 1-4 and 29 stand rejected under 35 U.S.C. §102(b) as being anticipated by, or under 35 U.S.C. §103(a) as obvious over, U.S. Patent No. 5,068,075, to Dundas et al. (hereafter, Dundas).

Applicant respectfully traverses the rejection in light of the claim amendments presented herein and for the reasons set forth below.

The present invention is related to an improved extrusion blow molding process for manufacturing a multilayer container having a wall with a transparent outer layer formed of a thermoplastic polymer that is transparent in solid state. The invention is based on the discovery that during the process of extrusion blow molding, rapid cooling of the polymer melts promotes transparency and that relatively slow cooling promotes a hazy appearance in the resulting polymeric walls (see page 12, lines 5-15 of the specification). A conventional extrusion blow molding process for manufacturing a container having a multi-layer thermoplastic polymeric wall includes the steps of (1) heating and co-extruding the polymers to obtain polymer melts; (2) passing the polymer melts through a blow molding die to form a tubular parison; (3) depositing the parison into an open mold; and (4) closing and pinching off the parison; and (5) inflating the parison into a blow molded structure (i.e., a container or bottle or an inflated parison), while cooling the blow molded structure from the outside surface by providing a cooled mold. In order to obtain a container having a relatively thick transparent outer wall, the present inventor has made a number of modifications and improvements to arrive at the presently claimed process. First, in the extrusion step, the extrusion heads are modified such that the thermoplastic polymer, especially the polymer making up the outer wall of the container, is extruded as a homogeneous and gel-free melt (see page 11, lines 17-30 and page 15, lines 22-29 of the specification. Secondly, during the inflation step, a "second cooling means" is provided to cool the blow molded structure from the inside. In one specific embodiment, this "second cooling means" comprises a means for discharging cold gas under pressure into the inner cavity of the parison and optionally an additional means for allowing the escape of warm air from the inside of the blow molded structure. In another embodiment, the "second cooling means" is a blow-pin which has a nozzle that fits into the opening of the parison cavity and discharges the

cold gas into the parison cavity under pressure. In yet another embodiment, the blow-pin is covered by a cooling jacket over at least 95% of the blow-pin surface, not inclusive of the nozzle. In yet another embodiment, the nozzle of the blow-pin has a cut or a rough surface. See e.g., page 16, lines 14-16 of the specification. Last, a symmetrical pinch-off means is provided in the mold to facilitate the formation of a transparent layer that is continuous around the periphery of the article. See e.g., page 14, lines 4-11 and page 16, lines 17-20 of the specification.

Dundas is related to a method of manufacturing a sealed aseptic bottle wherein the pressure of the gas in the interior of the bottle when sealed is sub-atmospheric to prevent distortion of the bottle. The Examiner states that a "second cooling means" for cooling the inside of the blow molded structure is also taught by Dundas. However, the "second cooling means" referenced is different from the one recited in the present invention. For example, at column 1, lines 40-47, Dundas teaches that after the parison is inflated with pressurized gas, the pressure of the blow air is maintained for a sufficient time to cool and then the blow air is vented to the exterior of the bottle, wherein the residual air in the bottle is expansion-cooled. In other words, while the "second cooling means" recited by the present claims discharges pressurized cold gas into the parison cavity during inflation, the "second cooling means" used in Dundas refers to the venting of pressurized gas out of the bottle, i.e., the blow molded structure, post inflation. Moreover, because the "second cooling means" is applied during inflation in the present invention, together with the "first cooling means" provided by the cold mold, it allows the polymeric wall of the blow molded structure to be cooled rapidly, thereby obtaining a container with a transparent polymeric wall. In Dundas, however, because the "second cooling means" is a result of the venting of pressurized air out of the bottle post inflation, it would not facilitate or improve the rapid cooling of the polymeric wall as efficiently as does the presently claimed "second cooling means".

In addition, the present claims recite the step of obtaining a polymer melt that is homogeneous and gel-free. Dundas, however, only discloses that "the parison is extruded at a high temperature ... with the plastic resin in an easily flowable, molten or near molten state" (column 3, lines 31-33).

In summary, since all the pending claims, as amended herein, recite the steps of (i) obtaining a homogeneous or gel-free polymer melt that forms the outer layer of the container wall and (ii) applying a "second cooling means" during the inflation of the parison, which features have not been taught or suggested by Dundas, it is submitted that they are, therefore, not anticipated by or obvious over Dundas.

Because claims 17-20 have been canceled, the rejection thereof under 35 U.S.C. §102(b) over European Patent No. 1 072 399, to Michihata et al., (hereafter Michihata) is now moot.

Claims 5-8 stand rejected over Dundas as described at page 9 of the Official Action. The Examiner asserts that although Dundas fails to expressly disclose the specific temperatures of the cold gas, it would have been *prima facie* obvious to adjust the venturi to further cool the gas to temperatures specified in the present claims. However, as explained above, the venting of pressured air out of the blow molded structure post inflation (disclosed by Dundas) is different and distinct from and does not anticipate the discharge of pressurized cold gas into the parison cavity during inflation (recited in the present claims). Therefore, it is respectfully submitted that claims 5-8 are not obvious over Dundas.

Claims 9-12 stand rejected under 35 U.S.C. §103(a) as obvious over Dundas, in view of U.S. Patent No. 3,882,259 to Nohara et al. (hereafter, Nohara) or U.S. Patent No. 4,079,850 to Suzuki et al. (hereafter, Suzuki) (pages 9-10). Specifically, it is the Examiner's position that it is *prima facie* obvious to modify the method taught by Dundas by employing the specific ionomeric acid copolymer taught by either Nohara or Suzuki. Additionally, regarding claim 12, it is stated that Dundas has also taught a pinched point that is flat or tapered at least slightly toward the inner cavity of the blow molded structure. However, here again, none of the cited references discloses the "second cooling means" recited by the present claims. "To establish a *prima facie* case of obviousness... the prior art reference (or references when combined) must teach or suggest all the claim limitations." (See MPEP §2143) Accordingly, a *prima facie* case of obviousness has not been established and it is respectfully requested that the rejection be withdrawn.

Claim 12 stands rejected under 35 U.S.C. §103(a) as obvious over Dundas, in view of Nohara or Suzuki, and further in view of U.S. Patent No. 6,303,071 to

Sugawara et al. (hereafter, Sugawara) (pages 10-11). In formulating this rejection, the Examiner states that although Dundas does not explicitly teach an active step of roughening the surface of the mold, Sugawara has taught an analogous method where the mold inner surface is embossed or roughened to produce a desired feature, and therefore rendering the subject matter of claim 12 obvious. Sugawara is related to a process for producing blow molded articles weighing 500 g or more and does not suggest or teach the "second cooling means" recited by the present claim. Therefore, it is respectfully requested that the obviousness rejection be withdrawn.

Claims 20-22 stand rejected under 35 U.S.C. §103(a) as unpatentable over Michihata, in view of Nohara or Suzuki (pages 11-12); claims 17-22 and 26 stand rejected as unpatentable under 35 U.S.C. §103(a) as unpatentable over Sugawara in view of Nohara or Suzuki (pages 12-14); and claim 26 stands rejected under 35 U.S.C. §103(a) as unpatentable over Dundas, in view of Nohara or Suzuki (pages 14-15). In light of the cancellation of these claims, it is requested that these rejections be withdrawn.

Claim 29 stands rejected under 35 U.S.C. §103(a) as unpatentable over Dundas in view of Sugawara (pages 15-17). Claim 29 depends from claim 1 and further recites the surface imperfections of the mold inner surface. The Examiner states that in addition to all the limitations recited in claim 1, Dundas also teaches a mold surface that is not polished and thus is roughened due to the existing surface imperfections. The Examiner also states that the although Dundas fails to expressly teach an active step of roughening the [inner] surface of the mold, Sugawara teaches an analogous method where the surface of the [mold] is embossed/roughened to produce a desired surface feature on the molded surface. It is therefore the Examiner's position that it would have been *prima facie* obvious to modify the teaching of Dundas with the embossed/roughened mold [inner] surface taught by Sugawara. However, as discussed above, in addition to the surface imperfections, Dundas also fails to teach or suggest the obtaining of a homogeneous gel-free melt of the thermoplastic resin that forms the outer wall of the container and the application of a "second cooling means" directly to the inside of the blow molded structure during the inflation of the parison. Accordingly, because each and every limitation recited in the present claim has not been taught or suggested by the

combined disclosure of Dundas and Sugawara, it is respectfully requested that the rejection of claim 29 over the cited references be withdrawn.

Claims 1-12 and 29 stand rejected under 35 U.S.C. §103(a) as obvious over Suzuki in view of U.S. Patent No. 3,789,093, to Bose, (hereafter Bose) (pages 17-19) for the following reasons.

Suzuki is related to a process of manufacturing a multi-layer blow molded container in such a manner that a tapered projection protruding outwardly in the thickness direction of the container wall is formed in the joint portion so that each of the polymer layers is substantially continuous in the joint portion (Abstract and Figure 2B). Bose is related to a process of accelerating the molding cycle while preventing the appearance of water marks, or "orange peel effect", on the surface of the blow molded structure. Specifically, in the process disclosed by Bose, the environment surrounding the molding parts is enclosed and filled with carbon dioxide (CO_2) which has a dew point considerably below that of the ambient air, so that the molds can be cooled to a temperature substantially below ambient temperature but greater than the dew point of any vapor trapped in the mold and therefore eliminating the formation of water marks on the surface of the blow molded structures, see, e.g., column 1, lines 21-33; column 1, line 63 – column 2, line 1; column 2, lines 40-47; and claim 1. In a further embodiment of the process disclosed by Bose, CO_2 was used to inflate the parison, and at least part of the CO_2 is vented thereafter to the enclosure surrounding the molding parts, see, e.g., column 4, lines 51-59 and claims 2 and 4.

Regarding claims 1-3, the Examiner states that although Suzuki fails to expressly disclose the cooling means recited in the present claims, Bose has taught a first and second cooling means to reduce the inside and outside of the blow molded structure to a temperature less than ambient while forming the structure, and therefore, the combined teachings of Suzuki and Bose renders the process recited by the present claims *prima facie* obvious. Applicant respectfully disagrees with this conclusion. As presented above, the "second cooling means" recited by the present claims is a cooling means that is applied directly to the inside of the blow molded structure. Bose, however, teaches a process that involves the enclosure of the molding area and filling it with dry CO_2, and optionally further involves the inflation of the parison with CO_2 and the venting of CO_2 back into the enclosed space, *supra*.

Nowhere does Bose teach or suggest the application of a "second cooling means" directly to the inside of the blow molded structure.

As for claims 4-8, the Examiner states that Bose teaches a process where the discharged gas is CO_2 at a temperature substantially below ambient and with a substantially lower dew point than ambient. Applicant disagrees with this statement for the following reasons. At column 1, lines 67-69, Bose teaches that the objects of the invention "may be realized ... by blanketing the mold area with dry carbon dioxide gas or a vapor which has a dew point considerably below that of the ambient air and cooling the **molds** to a temperature ..." Further at column 4, lines 37-58, Bose teaches that (i) after the open mold closes on the parison, "air or mixture of air and carbon dioxide gas is fed into the parison" (ii) after "the parison has been inflated into conformity with the mold surfaces, carbon dioxide liquid is injected into the molded part to cool it" and (iii) "the gas being exhausted (out of the inflated parison) ... is returned to the mold area..." Nowhere has Bose taught or suggested a second cooling means involving the discharge of cold gas into the inner cavity of the parison during inflation. Moreover, claim 12 further recites that "the pinched is flat or tapered at least slightly toward the inner cavity of the blow molded structure". In contrast, Suzuki teaches that the pinched area has "a tapered projection protruding outwardly in the thickness direction of the container wall".

Thus, because the cited reference fails to teach each and every limitation recited in the present claims, it is respectfully requested that the obviousness rejection be withdrawn.

Claim 29 stands rejected under 35 U.S.C. §103(a) as obvious over Suzuki in view of Bose and further in view of Sugawara (pages 20-21). The Examiner cites Sugawara as teaching that the inner surface of the mold may be embossed/roughened and therefore renders the subject matter of claim 29 obvious. As presented above, the second cooling means recited by claim 29, which is applied directly to the inside of the parison during inflation, is not taught or suggested by any of the cited references, and therefore, it is respectfully requested that the rejection of claim 29 be withdrawn.

Should any fee be required to obtain consideration of the amended claims, please charge the appropriate fee to Deposit Account No. 04-1928 (E.I. du Pont de Nemours and Company.)

In view of the foregoing amendments and remarks, Applicant respectfully requests all the rejections listed in the July 27, 2006 Office Action be withdrawn and the application be passed to issue. Should this reply be incomplete, or should the Examiner have any questions, comments or suggestions concerning this application, the Examiner is invited to telephone the undersigned at the below-listed direct dial telephone number in order to expedite prosecution.

Respectfully submitted,

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